Case Study

UNICOR Industrial Products Group DESIGNS NEXT-GENERATION POSTAL CONTAINER

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GROUP

To reduce bulk-mail shipping costs, the U.S. Postal Service (USPS) sought novel designs for the next-generation postal container—one that would be collapsible on all four sides to save cargo space when transported empty on the return trip.

At first glance, this assignment might seem like a walk in the park for experienced engineers. However, the new container had to meet a number of complex requirements, making it the design equivalent of climbing all 20,000 feet of Alaska's Mt. McKinley.

Design Challenges

- **Collapsibility on all four sides**—to make the most of cargo space on the return trip
- **A low weight-to-load ratio**—while the container could weigh no more than 380 pounds, it had to support a total of 6,600 pounds of mail
- **Easy stackability**—in both upright and collapsed positions and with existing USPS containers
- **Work seamlessly**—with many different types of bulk-mail handling equipment at USPS distribution centers
- **Durability for weathering day-in, day-out use**—but be easy for postal employees to collapse, stack and return to an upright position

UNICOR Expertise

A number of companies competed to design the next-generation postal container, but the designer and manufacturer that won this assignment was the UNICOR Industrial Products Group (IPG).

UNICOR IPG had been under a USPS contract a year earlier to repair existing bulk-mail containers. "We saw that UNICOR had the expertise not only to repair containers but to design and prototype new ones," said Gary Booth, Program Manager, Mail Transport Equipment, USPS.

When the final design was approved, USPS officials gave UNICOR IPG very positive feedback on the results. "The bulk-mail container met and exceeded all of our requirements for towability, stackability, ease of handling and the capacity to hold up to 6,600 pounds," Booth said. "In fact, Michigan State University's School of Packaging testing group couldn't get the container to fail the weight standard," he added.

A long-term supplier of the federal government, UNICOR IPG is fully staffed and equipped to develop and produce almost any metal product, from missile components to vehicular parts and distribution equipment.

UNICOR also has a Product Support Center in Littleton, Colorado, which delivered exceptional service in developing the next-generation postal container. This sophisticated center provides product research, design and development services to the U.S. military and other federal government customers.

Innovative Solutions

Booth commented that "the staff at the UNICOR Product Support Center was very responsive to our needs. I couldn't have asked for anything better. For the first design iteration, we explained to them in engineering terms what we wanted. From this, they were able to come back with a working prototype."

At the time, the USPS was using non-collapsible bulk-mail containers. Since the sides remained upright, these old-style containers could be stacked only two high in trailers, and did not make the most efficient use of space when empty on the return trip.

The top-priority change that USPS officials sought for the next-generation container was a design that was collapsible on all four sides, but robust enough to withstand the daily rigors of long-distance transit and mail-handling equipment.

UNICOR IPG's product design group for metals met both requirements with a heavy-duty welded wire-grid container that collapsed inwardly about half-way down on all four sides. This new container design maximized shipping space while still meeting durability and weight standards.

In a further innovative step, the product design group also ensured that the collapsible sides made a positive stop at a 90-degree angle. This formed a "lid," allowing the container to be partially filled with mail in the collapsed position, if needed, on outbound trips.

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Increased Capacity up to 30%

Whether inbound or outbound, the new container prototype, when collapsed, stacked three high, versus two high with existing containers, effectively increasing the number of containers in a tractor-trailer load by up to 30%.

The UNICOR product design group met the six-week deadline to develop and deliver the first prototype. Dan Moore, UNICOR IPG's General Manager, reported, "In all, we developed four different prototypes, each within short timeframes. Along the way, we changed the prototype container's footprint to accommodate new automated equipment that was in the design stages and hadn't yet been deployed to USPS distribution centers."

Each prototype was tested at mail distribution centers and by USPS package design consultants at Michigan State University's School of Packaging. After testing the fourth prototype, the USPS declared that this next-generation design met or exceeded all requirements, Moore said.

Wins Production Contract

When the USPS looked for a manufacturer, UNICOR IPG won the production assignment. Booth noted, "We knew from working with UNICOR previously that they produced quality products that tested well and exceeded specifications—and the price was competitive."

The USPS, he said, contracted for 50,000 next-generation containers at the time and "we're positioned to buy more containers in the future."

Booth is now working with UNICOR IPG's staff at the El Reno, Oklahoma, metal factory to improve first-class mail containers.

UNICOR—Quality Products, Social Role

UNICOR IPG is one of seven business groups within UNICOR/Federal Prison Industries, a self-funded, self-sufficient government enterprise charged with providing valuable job training and work experience for federal inmates.

The engineering and technical staff at the Product Support Center in Littleton, Colorado, is highly skilled at Computer-Aided Design (CAD) and supports UNICOR IPG and other business groups.

In addition to design services, the Product Support Center incorporates an Environmental Testing Laboratory, which can duplicate environmental conditions anywhere in the world to ensure that products meet exacting military and federal specifications.

While UNICOR has supplied high-quality products and services to the federal government for more than 70 years, it has a vital social role—providing federal inmates with the necessary job training and skills to make a successful transition to law-abiding, contributing members of society. Research shows that federal inmates who worked in UNICOR vocational programs were 24 percent less likely to return to prison than those who did not participate.

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